

WHAT IS CLAIMED IS:

1. A thin film magnetic head comprising:
  - a lower core layer;
  - 5 an upper core layer;
  - a recording section comprising a nonmagnetic gap layer disposed between the lower and upper core layers near a surface facing a recording medium;
  - a connecting portion for magnetically connecting the
  - 10 lower core layer and the upper core layer in the rear of the recording section;
  - a coil comprising a conductor layer wound in a spiral planar shape around the connecting portion; and
  - a first radiating layer disposed in the rear of the
  - 15 lower core layer to be separated from the lower core layer;
  - wherein the coil has a portion facing the lower core layer through an insulating layer, and a portion facing the first radiating layer through the insulating layer.
- 20 2. A thin film magnetic head comprising:
  - a lower core layer;
  - an upper core layer;
  - a recording section comprising a nonmagnetic gap layer disposed between the lower and upper core layers near a
  - 25 surface facing a recording medium;
  - a connecting portion for magnetically connecting the lower core layer and the upper core layer in the rear of the recording section;

a coil comprising a conductor layer wound in a spiral planar shape around the connecting portion;

an upper shield layer disposed below the lower core layer with a separating insulating layer provided

5 therebetween, the separating insulating layer comprising an insulating material;

a reproducing magnetoresistive element disposed below the upper shield layer near the surface facing the recording medium;

10 a lower shield layer disposed below the magnetoresistive element with an insulating layer provided therebetween; and

at least one of first, second and third radiating layers;

wherein the first radiating layer is disposed in the rear of the lower core layer to be separated from the lower core layer, the second radiating layer is disposed in the rear of the upper shield layer to be separated from the upper shield layer, and the third radiating layer is disposed in the rear of the lower shield layer to be separated from the lower shield layer; and

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the coil has a portion facing the lower core layer through an insulating layer, and a portion facing any one of the first, second and third radiating layers through the insulating layer.

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3. A thin film magnetic head according to claim 2, wherein at least two of the first, second and third radiating layers are provided to partially face each other in the

thickness direction.

4. A thin film magnetic head according to claim 2,  
wherein assuming that a direction along a direction in which  
5 the track width of the recording section is determined is a  
width direction, the second radiating layer extends to both  
ends of the upper shield layer in the width direction.

5. A thin film magnetic head according to claim 2,  
10 wherein the second radiating layer is formed to the same  
thickness as the upper shield layer by using the same  
material as the upper shield layer.

6. A thin film magnetic head according to claim 2,  
15 wherein the second radiating layer is formed to the same  
thickness as the upper shield layer by using a material  
having higher thermal conductivity than that of the upper  
shield layer.

20 7. A thin film magnetic head according to claim 2,  
wherein the second radiating layer and first radiating layer  
are connected to each other through a first connecting  
portion.

25 8. A thin film magnetic head according to claim 7,  
wherein the first connecting portion is combined with one of  
the first and second radiating layers.

9. A thin film magnetic head according to claim 2,  
wherein assuming that a direction along a direction in which  
the track width of the recording section is determined is a  
width direction, the third radiating layer extends to both  
5 ends of the lower shielding layer in the width direction.

10. A thin film magnetic head according to claim 2,  
wherein the third radiating layer is formed to the same  
thickness as that of the lower shield layer by using the same  
10 material as the lower shield layer.

11. A thin film magnetic head according to claim 2,  
wherein the third radiating layer is formed to the same  
thickness as that of the lower shield layer by using a  
15 material having higher thermal conductivity than that of the  
lower shield layer.

12. A thin film magnetic head according to claim 2,  
wherein the third radiating layer and the second radiating  
20 layer are connected to each other through a second connecting  
portion.

13. A thin film magnetic head according to claim 12,  
wherein the second connecting portion is combined with one of  
25 the second and third radiating layers.

14. A thin film magnetic head according to claim 2,  
wherein assuming that a direction along a direction in which

the track width of the recording section is determined is a width direction, the first radiating layer extends to both ends of the lower core layer in the width direction.

5        15. A thin film magnetic head according to claim 2, wherein the first radiating layer is formed to the same thickness as that of the lower core layer by using the same material as the lower core layer.

10       16. A thin film magnetic head according to claim 2, wherein the first radiating layer is formed to the same thickness as that of the lower core layer by using a material having higher thermal conductivity than that of the lower core layer.

15       17. A thin film magnetic head according to claim 2, wherein the facing area between the coil and the lower core layer is larger than that between the coil and the first radiating layer.

20       18. A thin film magnetic head according to claim 1, wherein assuming that a direction along a direction in which the track width of the recording section is determined is a width direction, the first radiating layer extends to both  
25 ends of the lower core layer in the width direction.

19. A thin film magnetic head according to claim 1, wherein the first radiating layer is formed to the same

thickness as that of the lower core layer by using the same material as the lower core layer.

20. A thin film magnetic head according to claim 1,  
5 wherein the first radiating layer is formed to the same thickness as that of the lower core layer by using a material having higher thermal conductivity than that of the lower core layer.

10 21. A thin film magnetic head according to claim 1, wherein the facing area between the coil and the lower core layer is larger than that between the coil and the first radiating layer.